

What is claimed is:

1. A method for measuring planarized features on a wafer of a semiconductor device, comprising the steps of:

5 illuminating the planarized features on the wafer;
 detecting a reflected light beam with respect to the planarized features; and

10 analyzing optical characteristics of the reflected light beam to determine information corresponding to the planarized features.

2. The method of claim 1, wherein the information comprises sizes of the planarized features.

15 3. The method of claim 1, wherein the information comprises grating compositions of the planarized features.

20 4. The method of claim 1, wherein said detecting step is performed using an ellipsometric technique.

5. The method of claim 1, wherein said detecting step is performed using a scatterometric technique.

6. The method of claim 1, wherein said detecting step is performed using a reflectometric technique.

7. The method of claim 1, wherein said detecting
5 step is performed using a polarimetric technique.

8. The method of claim 1, wherein said detecting
step is performed using at least one of an ellipsometric, a
scatterometric, a reflectometric, and a polarimetric
10 technique.

9. The method of claim 1, wherein said analyzing
step maximizes an analysis of the optical characteristics
based upon a simplified geometry of the planarized features
with respect to a geometry of similar, un-planarized
15 features.

10. The method of claim 1, wherein said analyzing
step maximizes an analysis of the optical characteristics
20 based upon a reduction in complexity of the planarized
features due to a similarity in refractive indexes
corresponding to a bulk silicon substrate and a poly
silicon fill of the semiconductor device.

11. A system for measuring planarized features on a wafer of a semiconductor device, comprising:

an illumination tool for illuminating the planarized features on the wafer;

5 a detection tool for detecting a reflected light beam with respect to the planarized features; and

an analysis tool for analyzing optical characteristics of the reflected light beam to determine information corresponding to the planarized features.

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12. The system of claim 11, wherein the information comprises sizes of the planarized features.

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13. The system of claim 11, wherein the information comprises grating compositions of the planarized features.

14. The system of claim 11, wherein said detection tool employs an ellipsometric technique to detect the reflected light.

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15. The system of claim 11, wherein said detection tool employs a scatterometric technique to detect the reflected light.

16. The system of claim 11, wherein said detection tool employs a reflectometric technique to detect the reflected light.

5 17. The system of claim 11, wherein said detection tool employs a polarimetric technique to detect the reflected light.

10 18. The system of claim 11, wherein said detection tool employs at least one of an ellipsometric, a scatterometric, a reflectometric, and a polarimetric technique to detect the reflected light.

15 19. The system of claim 11, wherein said analysis tool maximizes an analysis of the optical characteristics based upon a simplified geometry of the planarized features with respect to a geometry of similar, un-planarized features.

20 20. The system of claim 11, wherein said analysis tool maximizes an analysis of the optical characteristics based upon a reduction in complexity of the planarized features due to a similarity in refractive indexes

corresponding to a bulk silicon substrate and a poly silicon fill of the semiconductor device.

21. A method for measuring planarized features on a
5 wafer of a semiconductor device, comprising the steps of:
illuminating the planarized features on the wafer;
detecting a reflected light beam with respect to the
planarized features; and

analyzing optical characteristics of the reflected
10 light beam to determine information corresponding to the
planarized features, wherein said analyzing step comprises
the steps of:

maximizing an analysis of the optical
characteristics based upon a simplified geometry of the
15 planarized features with respect to a geometry of similar,
un-planarized features; and

maximizing the analysis of the optical
characteristics based upon a reduction in complexity of the
planarized features due to a similarity in refractive
20 indexes corresponding to a bulk silicon substrate and a
poly silicon fill of the semiconductor device.